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May 30, 2001

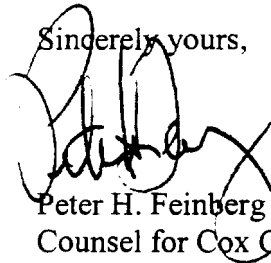
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Ronald Parver, Esquire  
Federal Communications Commission  
Room 4-A822  
445 12th Street, S.W.  
Washington, DC 20554

Dear Mr. Parver:

On behalf of Cox Communications, Inc., I am forwarding the attached response to the Bureau's survey questions and request for information on cable television system channel capacity and retransmission consent agreements in connection with the Commission's proceeding on Digital Broadcast Signal Carriage (CS Docket No. 98-120).

Sincerely yours,



Peter H. Feinberg  
Counsel for Cox Communications, Inc.

PHF/cmf  
Enclosures

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Ronald Parver, Esquire

May 30, 2001

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bcc: Alexander V. Netchvolodoff  
Alexandria M. Wilson, Esq.  
Alicia Long, Esq.

# Questions on Cable System Capacity and Retransmission Consent Agreements

## Question 1

Please complete the following table with the total number of subscribers served by all of your cable systems and your best estimates of the percentage of your total subscribers in each year that will be served by cable systems of the specified capacity. For each year the column percentages for the five system capacity classes ("Under 500 MHz" to ">750 MHz") should sum to 100.

**TOTAL NUMBER OF SUBSCRIBERS SERVED AND % DISTRIBUTION BY SYSTEM CAPACITY**

Cable System Capacity	Yearend 1999		Yearend 2000		Yearend 2001		Yearend 2002		Yearend 2003	
	Number	%	Number	%	Number	%	Number	%	Number	%
Cable System Capacity										
>750 MHz		2%		6%		16%		23%		26%
750 MHz		53%		63%		67%		69%		70%
Between 550 and 750 MHz		-		-		-		-		-
550 MHz		14%		11%		5%		4%		3%
Under 500 MHz		31%		20%		12%		4%		1%
<b>Total</b>		100%		100%		100%		100%		100%

## Question 2

Please provide, for each of the five capacity classes and for each year, a breakdown of the total MHz usable for downstream transmissions. The breakdown should be based on a representative cable system in each size class, specifically the one with the largest number of subscribers. For the >750, <550, and 550-750 MHz capacity classes, please specify the capacity of the system for which the information is being provided.

If the total downstream capacity does not equal total capacity minus the bandwidth below 54 MHz, please explain the discrepancy. Also please note if any capacity above 54 MHz is used for upstream services. Please provide the total MHz expected to be used for analog video transmission, the total MHz expected to be used for digital video transmission, and the total MHz expected to be used for other purposes, and list the anticipated other services. The sum of the total MHz used for analog, digital, and other downstream services should equal total MHz usable for downstream transmissions.

Year 1999		Subtract 54 MHz			
Capacity of Representative Cable System	Specific Capacity	Total MHz usable for downstream transmissions	Total MHz expected to be used for analog video	Total MHz expected to be used for digital video	Total MHz expected to be used for other downstream services+
>750 MHz*	860	806	546	120	140
750 MHz	696	696	546	100	50
550-750 MHz**	-	-	-	-	-
550 MHz	496	496	496	0	0
< 550 MHz***	450	396	396	0	0

+Other downstream services included local telephone and high-speed data services.

**Year 2000 (Unchanged from Year 1999)**

Capacity of Representative Cable System	Specific Capacity	Total MHz usable for downstream transmissions	Total MHz expected to be used for analog video	Total MHz expected to be used for digital video	Total MHz expected to be used for other downstream services+
>750 MHz*	860	806	546	120	140
750 MHz	750	696	546	100	50
550-750 MHz**	-	-	-	-	-
550 MHz	550	496	496	0	0
< 550 MHz***	450	396	396	0	0

+Other downstream services included local telephone and high-speed data services.

**Year 2001 (Unchanged from Year 1999)**

Capacity of Representative Cable System	Specific Capacity	Total MHz usable for downstream transmissions	Total MHz expected to be used for analog video	Total MHz expected to be used for digital video	Total MHz expected to be used for other downstream services+
>750 MHz*	860	806	546	120	140
750 MHz	750	696	546	100	50
550-750 MHz**	-	-	-	-	-
550 MHz	550	496	496	0	0
< 550 MHz***	450	396	396	0	0

+Other downstream services include local telephone and high-speed data services.

**Year 2002** (Note: These figures are very speculative and should not be considered firm commitments.)

Capacity of Representative Cable System	Specific Capacity	Total MHz usable for downstream transmissions	Total MHz expected to be used for analog video	Total MHz expected to be used for digital video+	Total MHz expected to be used for other downstream services++
>750 MHz*	860	806	504 - 546	120 - 138	140 - 164
750 MHz		696	504 - 546	100 - 118	50 - 74
550-750 MHz**	-	-	-	-	-
550 MHz		496	496	0	0
< 550 MHz***	450	396	396	0	0

+ Any estimation of bandwidth usage in the year 2002 is very speculative. Actual bandwidth utilization will be based on market conditions, including changes in customer demand for current and future services as well as technological changes and innovations. Indeed, because it is impossible to be precise in making such estimates, Cox is providing a range of possible outcomes in each category. Depending on market conditions in 2002, even these ranges may prove to be inaccurate.

Nonetheless, in an effort to provide the information which the Commission is seeking, Cox estimates that in 2002 it will slightly increase its spectrum allocations for digital video and other downstream services and slightly decrease its spectrum allocation for analog video. Using less spectrum for analog services means that some existing analog channels, which are heavily watched by Cox's customers, will have to be taken away from those customers. As Cox's past experience with analog channel changes demonstrates, this will be a risky and costly decision that will be very disruptive and inconvenient to Cox's customers. Cox accordingly will embark on this course only if it determines that 'customer demand for new services compels it to do so.

++ Due to rapidly changing marketplace conditions, it is difficult to predict with any certainty which downstream services in addition to analog and video services Cox cable systems will provide in 2002. It is likely that Cox will continue to provide local telephone and high-speed data services. New downstream services that Cox may deploy on some or all of its cable systems include interactive television, streaming media, IP telephony, high definition television, digital audio, home networking and home security services, among others. Some, but not all, of these services also will require Cox to allocate additional spectrum for upstream transmissions.

**Year 2003** (Note: These figures are extremely speculative and should not be considered firm commitments.)

	Specific Capacity	Total MHz usable for downstream transmissions	Total MHz expected to be used for analog video	Total MHz expected to be used for digital video+	Total MHz expected to be used for other downstream services++
++ Due to rapidly changing marketplace conditions, it is impossible to predict with any certainty which downstream services in addition to analog and video services Cox cable systems will provide in 2003. It is likely that Cox will continue to provide local telephone and high-speed data services. New downstream services that Cox may deploy on some or all of its cable systems include interactive television, streaming media, IP telephony, high definition television, digital audio, home networking and home security services, among others. Some, but not all, of these services also will require Cox to allocate additional spectrum for upstream transmissions.	860	806	396 - 546	120 - 186	140 - 224
750 MHz		696	396 - 546	100 - 186	50 - 114
550-750 MHz**	-	-	-	-	-
550 MHz		496	496	0	0
< 550 MHz***	-	-	-	-	-

+ Any estimation of bandwidth usage in the year 2003 is extremely speculative. Actual bandwidth utilization will be based on market conditions, including changes in customer demand for current and future services as well as technological changes and innovations. Indeed, because it is impossible to be precise in making such estimates, Cox is providing a range of possible outcomes in each category. Depending on market conditions in 2003, even these ranges may prove to be inaccurate.

Nonetheless, in an effort to provide the information which the Commission is seeking, Cox estimates that in 2003 it will continue to increase its spectrum allocation for digital video and other downstream services and decrease its spectrum allocation for analog video. As noted above, using less spectrum for analog services means that some existing analog channels, which are heavily watched by Cox's customers, will have to be taken away from those customers. As Cox's past experience with analog channel changes demonstrates, this will be a risky and costly decision that will be very disruptive and inconvenient to Cox's customers. Cox accordingly will embark on this course only if it determines that customer demand for new services compels it to do so.

++ Due to rapidly changing marketplace conditions, it is impossible to predict with any certainty which downstream services in addition to analog and video services Cox cable systems will provide in 2003. It is likely that Cox will continue to provide local telephone and high-speed data services. New downstream services that Cox may deploy on some or all of its cable systems include interactive television, streaming media, IP telephony, high definition television, digital audio, home networking and home security services, among others. Some, but not all, of these services also will require Cox to allocate additional spectrum for upstream transmissions.

\* fill in a capacity greater than 750 MHz if applicable, or enter NA if no systems in the >750 MHz category

\*\* fill in a capacity between 550 and 750 MHz if applicable, or enter NA if no systems in the 550-750 MHz category

\*\*\* fill in a capacity below 550 MHz if applicable, or enter NA if no systems in the <550 MHz category

Please explain here any discrepancies between capacity usable for downstream transmissions and total capacity minus the bandwidth below 54 MHz:

Unusable spectrum in the FM Band and the 4 MHz Guard Band between channels 4 and 5 may reduce the spectrum actually available to less than the numbers specified above. In addition, signaling (including pilot/control carriers and proprietary out-of-band signaling to the set-top box) also could reduce the spectrum actually available to less than the numbers shown.

### Question 3

For each capacity class and year entered in question 2, please provide (i) information on the digital modulation techniques you intend to use and (ii) a further breakdown of the total MHz expected to be used for downstream digital video transmission. To answer this question, use the same representative cable systems that you used in question 2. What modulation technique do you expect to use (e.g., 64 QAM, 256 QAM)? How many MHz do you anticipate devoting to HDTV transmissions and how many HDTV program streams do you anticipate transmitting in each 6 MHz of spectrum devoted to that purpose? How many MHz do you anticipate devoting to standard definition television program streams and how many such program streams do you anticipate transmitting in each 6 MHz of spectrum devoted to that purpose?

NOTE: If you plan to use different modulation techniques on a single system or on different systems in the same capacity class, please explain below. If the number of HDTV or SDTV program streams per 6 MHz is expected to vary, please indicate a typical figure in the table and explain the range of variation below.

#### YEAR 1999

Capacity of Representative Cable System	Specific Capacity	Total MHz expected to be used for digital video transmission (from question 2)	Modulation technique	MHz expected to be devoted to HDTV transmissions (broadcast or nonbroadcast)	HDTV Program streams per 6 MHz	MHz expected to be devoted to standard definition video	SDTV program streams per 6 MHz
>750 MHz*	860	120	64	0	-	-	-
750 MHz	-	100	64	0	-	-	-
550-750 MHz**	-	-	-	-	-	-	-
550 MHz	-	0	-	0	-	-	-
<550 MHz***	450	0	-	0	-	-	-

**YEAR 2000**

Capacity of Representative Cable System	Specific Capacity	Total MHz expected to be used for digital video transmission (from question 2)	Modulation technique	MHz expected to be devoted to HDTV transmissions (broadcast or nonbroadcast)	HDTV Program streams per 6 MHz	MHz expected to be devoted to standard definition video	SDTV program streams per 6 MHz
>750 MHz*	860	120	64	0	-	-	-
750 MHz		100	64	0	-	-	-
550-750 MHz**	-	-	-	-	-	-	-
550 MHz		0	-	0	-	-	-
<550 MHz***	450	0	-	0	-	-	-

**YEAR 2001**

Capacity of Representative Cable System	Specific Capacity	Total MHz expected to be used for digital video transmission (from question 2)	Modulation technique	MHz expected to be devoted to HDTV transmissions (broadcast or nonbroadcast)	HDTV Program streams per 6 MHz	MHz expected to be devoted to standard definition video	SDTV program streams per 6 MHz
>750 MHz*	860	120	64	0	-	-	-
750 MHz		100	64	0	-	-	-
550-750 MHz**	-	-	-	-	-	-	-
550 MHz		0	-	0	-	-	-
<550 MHz***	450	0	-	0	-	-	-

**YEAR 2002**

Capacity of Representative Cable System	Specific Capacity	Total MHz expected to be used for digital video transmission (from question 2)	Modulation technique	MHz expected to be devoted to HDTV transmissions (broadcast or nonbroadcast)	HDTV Program streams per 6 MHz	MHz expected to be devoted to standard definition video	SDTV program streams per 6 MHz
>750 MHz*	860	138 - 120	64/256	0 - 12	Up to 2	0	-
750 MHz		118 - 100	64/256	0 - 12	Up to 2	0	-
550-750 MHz**	-	-	-	-	-	-	-
550 MHz		0	-	0	-	-	-
<550 MHz***	450	0	-	0	-	-	-

**YEAR 2003**

Capacity of Representative Cable System	Specific Capacity	Total MHz expected to be used for digital video transmission (from question 2)	Modulation technique	MHz expected to be devoted to HDTV transmissions (broadcast or nonbroadcast)	HDTV Program streams per 6 MHz	MHz expected to be devoted to standard definition video	SDTV program streams per 6 MHz
>750 MHz*	860	186 - 120	64/256	0 - 30	Up to 2	0	-
750 MHz		186 - 100	64/256	0 - 30	Up to 2	0	-
550-750 MHz**	-	-	-	-	-	-	-
550 MHz		0	-	0	-	-	-
<550 MHz***	450	0	-	0	-	-	-

\* fill in a capacity greater than 750 MHz if applicable, or enter NA if no systems in the >750 MHz category

\*\* fill in a capacity between 550 and 750 MHz if applicable, or enter NA if no systems in the 550-750 MHz category

\*\*\* fill in a capacity below 550 MHz if applicable, or enter NA if no systems in the <550 MHz category

Please describe here any situations in which you plan to use different modulation techniques on a single system or on different systems in the same capacity class.

Note: Any estimation of bandwidth usage beyond 2002 is highly speculative. Actual bandwidth utilization will be based on market conditions, customer demand, technological innovation/changes, and the increasing demand for both current and future services.

Both 64 QAM and 256 QAM will likely need to be used on all Motorola systems for the foreseeable future due to legacy Digital set-tops (DCT 1000) that cannot work with 256 QAM. We have several hundred-thousand of these boxes, scattered throughout our Motorola systems that still have a useful/financial life, and will not be retired anytime soon.

If the number of HDTV program streams per 6 MHz is expected to vary, please explain the range of variation here.

It could vary between 1 and 3 HDTV program streams per 6 MHz depending on the Broadcast transmission format and content. 256 QAM could handle up to 3 - 12.9 MB/s streams, or 2 - 19.3 MB/s streams.

64 QAM, on the other hand, could handle a single 19.3 MB/s HD stream, or 2 - 12.9 MB/s streams.

Sports or other "active" programming may require more bandwidth than movies. This is a natural phenomenon of the MPEG transmission format.

#### Question 4

On Chart 4A below, please list the cable systems and television stations for which you have negotiated retransmission consent agreements that include carriage of digital transmissions by the station. For each television station, please include in parentheses the network affiliation if any. Please include, if known, the capacity of each system in MHz, the Designated Market Area ("DMA") in which the station is located, when digital carriage is scheduled to commence, the modulation technique you intend to use (e.g., 8 VSB, 64 QAM, 256 QAM), the format (480P, 720P, 1080I, something else) of the signal as received from the broadcaster, and the format that you plan to use for retransmission through the system to subscribers.

On Chart 4B below, please provide the best information available at this time on pending retransmission consent negotiations, if possible. If you have pending negotiations with respect to more than 10 systems, please provide information for the five largest and the five smallest systems, measured by number of subscribers.

Note: If you have signed digital retransmission agreements with a television station for more than one cable system, please make a separate entry for each cable system.

Please use additional pages if necessary for response.

**CHART 4A: COMPLETED RETRANSMISSION CONSENT AGREEMENTS TBD - Legal Dept.**

DMA	Television Station (with affiliation status)	Cable System	System Capacity (MHz)	Date Carriage Commenced or is to Commence	Modulation Technique	Broadcast Transmission Format	Retransmission Format	Number of Stations in DMA now transmitting a digital signal

**CHART 4B: RETRANSMISSION CONSENT AGREEMENTS IN NEGOTIATION**

DMA	Television Station (with affiliation status)	Cable System	System Capacity (MHz)	Date Carriage Commenced or is to Commence	Modulation Technique	Broadcast Transmission Format	Retransmission Format	Number of Stations in DMA now transmitting a digital signal

Comments on Capacity Allocation<sup>1</sup>

As previously noted in comments filed by Cox in the FCC's broadband access Notice of Inquiry, Cox will spend nearly \$10 billion to improve its cable networks, including installing additional fiber optic cable, "hardening" system headends for improved reliability, installing management information systems and cable modem terminating systems, and expending incremental capital outlays for items such as cable modems, advanced set-top boxes, and telephone network interface units. These improvements increase the capacity of Cox's cable networks to 750 MHz and enable them to reliably carry two-way traffic. The improvements are necessary to allow Cox to provide advanced two-way digital video, voice, and data services.

It will take Cox over six years from the 1996 Act to finish upgrading its cable systems to 750 MHz. Since it embarked upon these substantial system upgrades, Cox has been operating a free-cash-flow negative business – spending more money on capital expenditures than it receives in cash each year. This makes Cox a net borrower of money. Going forward, it is an understatement that Cox's creditors and stockholders will be impatient to see its substantial capital investments end. They will be equally impatient to see these investments producing free-cash-flow. Cox cannot endlessly operate a free-cash-flow negative business. Therefore, any additional upgrading of Cox's cable systems will have to be accomplished so that Cox can continue to operate in a prudent and business-like manner. It is critical that Cox maintain the flexibility to make the most effective use of its capacity and to respond to ever-changing market demands in order to achieve a reasonable return on investment for capital employed.

Even when Cox's cable networks have been upgraded to 750 MHz, the total amount of spectrum available for new services is still very limited. In many instances, Cox's systems have allocated spectrum beyond 600 MHz just for the carriage of analog programming. Since Cox must add at least 120 more video channels to offer programming services that are comparable and competitive to existing DBS services, the bulk of the added network spectrum capacity (120 MHz) is devoted to video, pay-per-view, and video-on-demand content. An additional 20-24 MHz is allocated for new digital voice services (10-12 MHz upstream, and 10-12 MHz downstream), and 16-24 MHz is allocated for digital high-speed data services (12 MHz Downstream, and 4-12 MHz upstream) – for residential and commercial/business customers. Finally, about 15 MHz is unusable for customer services because it must be devoted to separating upstream traffic from downstream traffic to prevent interference. In short, Cox has earmarked virtually all of the additional bandwidth added by its system upgrades for new competitive services.

In the future, there may be ways for Cox to re-gain some bandwidth for additional future services. But spectrum cannot be re-captured on Cox's upgraded cable plant easily or inexpensively. Indeed, all of the theoretical strategies that Cox might employ to introduce new services in the future would be very expensive, time-consuming and, in

many cases, would cause significant customer disruption and inconvenience. For example, Cox may in the future be able to use statistical multiplexing, move from 64 QAM to 256 QAM, convert analog channels to a digital tier, or even split nodes to recover additional spectrum on Cox's 750 MHz systems. Yet each of these approaches could only be implemented over a period of time, at considerable expense and inconvenience to the customer. Moreover, new bandwidth-hungry content and services, including possibly HDTV and video-on-demand, would likely contend for much of the capacity that Cox ultimately was able to reclaim. Indeed, the universe of technologies on the horizon makes it quite difficult for Cox to narrow down with any specificity the bandwidth it will need to dedicate to future services.

With this backdrop, several caveats should be noted in reviewing the attached response to the Channel Capacity Questionnaire:

- Any estimation of bandwidth usage beyond 2002 is highly speculative. The actual bandwidth ultimately utilized by a particular Cox system will be based on market conditions, customer demand, technological innovation and change, and the increasing demand for both current and future services.
- Although it may be possible for Cox to reclaim bandwidth for new services in the future, allocation of less spectrum for analog services would require that current analog channels be taken away from existing analog customers. As Cox has learned in the past, this is a very risky and costly move that inevitably is very disruptive and inconvenient for Cox's cable customers.
- Unusable spectrum in the FM Band and the 4 MHz guard band between channels 4 and 5 may reduce the spectrum actually available to less than the numbers specified in the charts. In addition, signaling via pilot/control carriers and proprietary out-of-band signaling to the set-top also could limit the spectrum actually available for new services.
- Both 64 QAM and 256 QAM will likely need to be used in all Cox systems with Motorola (GI) digital set-tops for the foreseeable future, due to legacy digital set-tops (DCT-1000) that cannot work with 256 QAM. Cox has several hundred thousand of these boxes, scattered throughout its Motorola systems, that still have a useful/financial life and thus will not be retired any time soon.

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<sup>i</sup> This narrative is intended to highlight some of the business realities faced by Cox in evaluating the appropriate uses for its bandwidth capacity. This is an ongoing process in the competitive market that exists today.

Comments on Retransmission Consent Negotiations for Digital Carriage

Cox's most recent retransmission consent negotiations with broadcasters revealed that digital carriage is still an evolving issue with broadcasters. The issue was certainly not the linchpin of negotiations for most broadcasters who generally had no firm vision for the use of their digital spectrum. Cox, however, did address the issue of digital carriage prospectively in many of its retransmission consent agreements, and has digital carriage arrangements or commitments with broadcasters in Omaha and North Carolina.

Cox Communications Omaha currently carries the high definition television (HDTV) signal of KMTV, a CBS affiliate, under a digital carriage agreement, separate from the analog retransmission consent agreement. This agreement was pursued jointly by the Cox system and the station to advance the business interests of both parties in a competitive landscape. Cox Communications North Carolina also carries, currently in analog format, the digital UPN channel of WCTI, the licensee of the ABC affiliate carried on its Greenville/New Bern system. Discussions are also underway with WRAL, the CBS affiliate in the Raleigh-Durham, North Carolina market, for carriage of its digital broadcast signal when it is launched.

Cox desires to supplement its current carriage of digital programming with additional digital programming, including digital broadcast signals, that appeals to its subscribers. With the exception of the specific arrangements discussed above, those broadcasters that sought a digital carriage commitment through retransmission consent negotiations were unable to describe the content of their future digital programming. While Cox was not willing to commit scarce channel space to undefined programming content, it was willing to agree to certain terms that should lead to future carriage of digital broadcast signals. For instance, Cox agreed in several contracts to a most favored nations commitment whereby Cox will carry the station's digital signal upon the carriage of any other broadcast digital signal in the same market. In other instances, including agreements with ABC and NBC, Cox agreed to negotiate in good faith for the carriage of the digital signal and to include certain triggering events that could subsequently lead to carriage of digital broadcast signals.

Cox continues to be receptive to clearly articulated proposals for digital carriage of broadcast signals, as evidenced by its discussions with the PBS group, which is far ahead of other broadcasters in presenting a vision for its digital transmissions. The PBS proposal, which includes identifiable public interest programming covering educational, job training and children's issues, is expected to yield a digital carriage agreement. Cox has also recently received, outside of the context of analog retransmission consent negotiations, a substantive proposal from Paxson Communications Corporation for carriage of digital broadcast stations that it plans to launch or acquire. The proposal is currently being evaluated and Cox will enter into discussions regarding the Paxson digital programming.

It is significant that Cox's most notable retransmission consent negotiations to date have not centered on digital carriage, but rather on a myriad of other concessions sought by broadcasters.

For example, the singular focus of TV station groups that are co-owned with cable programmers has been on securing carriage of these other non-broadcast programming services across all Cox markets. Other more amiable discussions with television stations have resulted in the joint development of news channels as a corollary to retransmission consent. Television broadcasters also commonly request that Cox cable systems provide them with advertising time as part of their retransmission consent negotiations, or they pursue other local broadcast initiatives such as local inserts on national news networks and joint promotions.

Broadcasters' lack of focus on digital carriage during the retransmission consent period, which provides them with significant leverage and a predictable forum, indicates that broadcasters have yet to refine their digital programming plans. Once broadcasters are able to clearly describe their proposed digital programming content and provide Cox an opportunity to consider the value of such programming to its cable customers in a competitive market, Cox will be able to evaluate (and implement) additional broadcaster requests for digital carriage on its cable systems as it has done with the carriage of broadcasters' non-broadcast services.